IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Norbert Städele

Application No.10/805,337

Filed: December 4, 2007

CORRUGATING MACHINE AND METHOD FOR THE MANUFACTURE OF SHEETS OF CORRUGATED BOARD

Examiner: Barbara J. Musser

Art Unit: 1791

APPEAL BRIEF

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I. REAL PARTY IN INTEREST

The present application is owned by BHS-Corrugated Maschinen-und Anlagenbau GmbH, of Paul-Engel-Strasse 1, D-92729 Weiherhammer, Germany. The assignment was recorded in the U.S.P.T.O. on August 4, 2004, at reel 014951, frame 0303.

II. RELATED APPEALS AND INTERFERENCES

None

III. STATUS OF CLAIMS

Claims 9, 11-12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Alden (WO 2004/041541A1) in view of Welschlau (U.S. Patent 4,587,898) as evidenced by Spann (U.S. Patent 6,491,361), and further in view of Loffler (U.S. Patent 5,602,746).

Claim 10 stands withdrawn from consideration as being directed to a non-elected species.

IV. STATUS OF AMENDMENTS

No amendments to the claims have been made subsequent to a Final Rejection. The present application is not under a Final Rejection, however the claims have been rejected more than two times.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The following chart reflects the appealed claims, and details where the claimed limitations are found in the specification.

CLAIM LIMITATIONS	SUPPORT IN SPECIFICATION
9. A method for the manufacture of sheets of corrugated board on a corrugating machine, comprising the following steps:	An apparatus and method are disclosed in the specification; see page 1, lines 8-15 related to the apparatus and page 1, lines 15-24 related to the method.
providing a corrugating machine which comprises at least two unroll stands for unwinding continuous webs of material as well as at least one processing equipment for producing at least one web of corrugated board from the webs of material;	A corrugating machine is provided, see Fig. 1 with unroll stands 2, 9, 21 and processing equipment 1, 42 for producing at least one web of corrugated board from the webs of material, see page 5, line 18 through page 8, last line.
determining the distances between adjacent marks (17, 18) on at least one of the webs of material (3) with at least one measuring device (19, 44; 19, 75, 76; 44; 75, 76) being in signaling connection with a control device (7);	Marks 17 and 18 are formed on the web 3 of material that extend crosswise of and parallel to, respectively, the working direction 15 of the web 3, see Fig. 3 and page 6, lines 6-15. A measuring device such as 19, Fig. 1, page 6, lines 24-29, is used to determine the distances a_1 and b_1 of Fig. 3. This measurement is signaled to the control device 7 (application control unit 7, see the next paragraph).

CLAIM LIMITATIONS	SUPPORT IN SPECIFICATION
determining a degree of shrinkage in at least one direction of the webs of material (3, 8, 22) based on the ratio of the distances of the marks (17, 18);	The degree of shrinkage in the web 3 is determined in at least one direction using the distances a_1 or b_1 and the distances a_2 or b_2, Fig. 4. The readers 19 and 44 (Fig. 6) relay the measurements via lines 20 and 45 to application control unit 7, see page 6, lines 24-29 and page 9, lines 19-26. The application control unit 7 determines the amount of shrinkage of the web 3 as it goes through the processing equipment, see page 11, the sentence beginning on line 16 through page 12, line 2.
determining scaling factors for the printing pattern by the control device (7) so that the desired size of the printing patterns will appear on the web;	Scaling factors are determined for the printing pattern 43 (various printing patterns can be seen in Fig. 5) by the application control device 7, see page 12, the sentence beginning on line 3.
digitally printing the printing pattern on at least one web of material on the corrugating machine in accordance with the determined scaling factors; and	The printing pattern 43 is printed by printing units 4, 26 on the web of material 3 based on the scaling factors, page 12, the sentence beginning on line 8.

CLAIM LIMITATIONS	SUPPORT IN SPECIFICATION
cutting the sheets of corrugated board from the digitally printed web of corrugated board in accordance with the shape and size of the digitally imprinted pattern.	Sheets of corrugated board are cut from the web 3 by longitudinal cutting stations 48 and crosscutting unit 54 in accordance with the shape and size of the digitally imprinted pattern, page 12, the sentence beginning on line 11 through line 22.
11. A method according to claim 9, wherein at least one web of material is printed digitally after it has been joined to at least a second web of material, forming a web of corrugated board.	In the embodiment of Fig. 7, the web may be printed digitally by printer 69 after it has been joined to a second web of material to form a corrugated board, see page 13, lines 20-21. This embodiment may be used with the printing units 4 and 26 of the embodiment of Figs. 1 and 6, see page 14, lines 22-25.
12. A method for the manufacture of sheets of corrugated board on a corrugating machine, comprising the following steps:	An apparatus and method are disclosed in the specification; see page 1, lines 8-15 for the apparatus and page 1, lines 15-24 for the method.
providing a corrugating machine which comprises at least two unroll stands for unwinding continuous webs of material as well as at least one processing equipment for producing at least one web of corrugated board from the webs of material;	A corrugating machine is provided, see Fig. 1 with unroll stands 2, 9, 21 and processing equipment 1, 42 for producing at least one web of corrugated board from the webs of material, see page 5, line 18 through page 8, last line.

CLAIM LIMITATIONS	SUPPORT IN SPECIFICATION
determining the distances between adjacent marks on at least one of the webs of material with at least one measuring device being in signaling connection with a control device, the adjacent marks comprising a first plurality of marks extending in a first direction parallel to the moving direction of the webs of material, and a second plurality of marks extending in a second direction perpendicular to the moving direction of the webs of material;	Marks 17 and 18 are formed on the web 3 of material that extend crosswise of and parallel to, respectively, the working direction 15 of the web 3, see Fig. 3 and page 6, lines 6-15. A measuring device such as 19, Fig. 1, page 6, lines 24-29, is used to determine the distances a_1 and b_1 of Fig. 3. This measurement is signaled to the control device 7 (application control unit 7, see the paragraph below).
determining a degree of shrinkage in the first and the second direction of the webs of material based on the ratio of the distances of the adjacent marks;	The degree of shrinkage in the web 3 is determined in the first and second directions using the distances a_1, b_1, , Fig. 3 and the distances a_2, b_2, Fig. 4. The readers 19 and 44 (Fig. 6) relay the measurements via lines 20 and 45 to application control unit 7, see page 6, lines 24-29 and page 9, lines 19-26. The application control unit 7 determines the amount of shrinkage of the web 3 in both directions as it goes through the processing equipment, see page 11, the sentence beginning on line 16 through page 12, line 2.

CLAIM LIMITATIONS	SUPPORT IN SPECIFICATION
determining scaling factors for the printing pattern by the control device responsive to the degree of shrinkage in the first and second directions so that the desired size of the printing patterns will appear on the web;	Scaling factors are determined for the printing pattern 43 (various printing patterns can be seen in Fig. 5) by the application control device 7, see page 12, the sentence beginning on line 3.
digitally printing the printing pattern on at least one web of material on the corrugating machine in accordance with the determined scaling factors; and	The printing pattern 43 is printed by printing units 4, 26 on the web of material 3 based on the scaling factors, page 12, the sentence beginning on line 8.
cutting the sheets of corrugated board from the digitally printed web of corrugated board in accordance with the shape and size of the digitally imprinted pattern.	Sheets of corrugated board are cut from the web 3 by longitudinal cutting stations 48 and crosscutting unit 54 in accordance with the shape and size of the digitally imprinted pattern, page 12, the sentence beginning on line 11 through line 22.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 9, 11-12 are unpatentable under 35 U.S.C. 103(a) over Alden (WO 2004/041541A1) in view of Welschlau (U.S. Patent 4,587,898), further in view of Spann (U.S. Patent 6,491,361), and further in view of Loffler (U.S. Patent 5,602,746).

The Examiner stated:

> Alden discloses a method of printed corrugated board wherein pre-formed sheets of corrugated board are printed using an ink-jet printer, and cut in accordance with the printed design. (Abstract; Pg. 2, II. 26-27) The reference does not disclose this process being part of in-line formation the corrugated web. [sic] Welschlau discloses forming a corrugated board by printing on a continuous web, joining the web with a corrugated web, and cutting the formed corrugated product. (Figure 1; Col. 6, II. 4-12) It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the process of Alden inline wherein the corrugated board is formed and then printed and cut since Welschlau discloses forming and cutting a corrugated web in an inline process and since this would allow continuous formation of the product. While Alden does not disclose the printer is a digital printer, Spann is cited to show that an ink jet printer is considered a digital dot matrix printer. (Col. 1, II. 13-15) Thus the ink jet printer of Alden is considered a digital printing process.
>
> The references cited above do not disclose a method to determine the shrinkage of the corrugated board or a method of determining scaling factors. Loeffler discloses printing on a sheet whose outer dimensions can change due to drying or dampening. The references discloses using sensors to determine the locations of marks on the paper to determine the amount of change in the outer dimensions and to compensate for this change when making the printing form. (Col. 2, II. 3-6; Col. 3, II. 48-57; Col. 4, II. 48-53) The reference does not clearly disclose how this compensation occurs, but one in the art would appreciate that compensating for the change in size of the printed image would require changing the size of the printing. It would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the shrinkage or expansion of the corrugated board by placing marks on the board and measuring their spacing downstream using a sensor to determine the change in the image size to modify the

printing size upstream so that the final image is the desired size since Loeffler discloses using marks to determine the amount of shrinkage or growth in the web so that the image can be altered to compensate for changes in the size of the printed image. (Col. 2, ll. 3-6; Col. 3, ll. 48-57; Col. 4, ll. 48-53)

Regarding claim 11, Alden discloses printing after forming the corrugated web.

Regarding claim 12, Loeffler discloses marking can be used in the direction of the length and width of the web. (Col. 4, ll. 52-56) One in the art would appreciate that the marking could be in any direction and that placing the marks parallel and perpendicular to the web movement would have been obvious since these are the obvious places to place such marks.

VII. ARGUMENT

Claims 9, 11-12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Alden (WO 2004/041541A1) in view of Welschlau (U.S. Patent 4,587,898), further in view of Spann (U.S. Patent 6,491,361), and further in view of Loffler (U.S. Patent 5,602,746) in the Office action of November 26, 2008.

Alden discloses a method of applying a graphic design pattern to workpieces that are made of corrugated board, the board being a laminate material comprising two substantially parallel covering layers of paper material and a core of corrugated fibreboard placed between the covering layers, and at least one diffusion layer. Page 2, lines 24-27; page 3, lines 8-10. The graphics pattern is printed using an ink-jet printer, which is digitally controlled. Page 2, lines 27-28. After the graphic pattern is applied to the workpiece surface, the workpiece continues through the line to a laser cutter 5, which cuts a predefined shape from the workpiece. Page 2, line 29-page 3, line 2. The laser cutter puts cuts in the workpiece so that items with a two dimensional design are created, which are then assembled into a three-dimensional, self-locking and self-supporting construction. Thus, the corrugated board used by Alden is pre-fabricated. Printing and cutting a pre-fabricated corrugated board does not constitute manufacture of corrugated board. For the manufacture of corrugated board, several webs of material are needed, at least one of which is corrugated in a fluting unit and subsequently united with at least another web of material to form a web of corrugated board. Alden does not relate to any of these steps, and thus, does not disclose a method of manufacturing corrugated board.

The Examiner acknowledges that Alden "does not disclose this process being part of in-line formation [of] the corrugated web." Office Action of November 26, 2008, page 2 (hereinafter, "OA"). Actually, the failures of disclosure in Alden of the claimed invention are more extensive than that. It does not teach or suggest a corrugated web at all; the workpieces 1 are precut corrugated board.

On page 4, third paragraph, the Examiner suggests that she does not understand the basis of Applicant's argument that Alden does not teach a corrugated web, but only precut corrugated board. The basis is that the problems attendant with printing on a prefabricated corrugated board are different than those encountered with printing on a corrugated web. Therefore during the production of sheets of corrugated board, one faced with problems in the prior art machines for forming corrugated boards using an inline process would not have been motivated to look for solutions in the technology for printing on precut corrugated boards.

Further, Alden does not recognize or discuss any shrinkage problems that can arise from the manufacturing process of sheets of corrugated board which are subject to heating and drying processes, or any suggestion of how to solve the negative effects that the shrinkage problems have on the printing process. Nor does he suggest scaling of the printed images to take into account that shrinking of the boardsince in the process of Alden there is no shrinkage problem. See Declaration of Norbert Städele, dated December 3, 2007, attached hereto in the Evidence Appendix, paragraph 6 (hereinafter "Städele, ¶ __").

On page 4, fourth paragraph, the Examiner states "[r]egarding applicant's argument that Alden does not disclose or recognize any problem with shrinkage, the fact that a reference does not recognize a problem that is recognized elsewhere does not mean that an invention is patentable." However, it does suggest that one of ordinary skill in the art seeking to solve shrinkage problems in methods of manufacture of corrugated boards using an inline process would not have been motivated to look to Alden to solve those problems.

The Examiner cites Welschlau as allegedly disclosing forming a corrugated board by printing on a continuous web, joining the web with a corrugated web, and cutting the formed corrugated product, citing Fig. 1, col. 6, lines 4-12. OA, page 2. Appellant respectfully submits that Welschlau teaches using carrier bands on which the printing forms are secured, or which are made of printing forms. Welschlau, col. 3, lines 9-17. Welschlau is

concerned with the problems arising from non-alignment of the images when two images have to be superimposed on one another on a moving web of material, and how to solve those problems using marks on the carrier band. Col. 4, line 51-col. 5, line 30. Welschlau discloses cutting the corrugated paper web according to the printed-on laterally adjacent numbers of pattern repeats, and cutting the web transversely. Col. 6, lines 8-15. There is nothing in Welschlau that discusses problems associated with shrinkage of the paper forming the corrugated web, or the effect of that shrinkage on the printing process, or any solutions to those problems.

The Examiner asserts that it would have been obvious "to make the process of Alden inline wherein the corrugated board is formed and then printed and cut since Welschlau discloses forming and cutting a corrugated web in an inline process and since this would allow continuous formation of the product." OA, page 2. However, Appellant respectfully submits that to combine Welschlau and Alden in this way would not have been obvious without the impermissible hindsight reconstruction of Appellant's claimed invention. Nothing in Alden discusses the need to form corrugated board in an inline process. Furthermore, Alden does not relate to printing on webs of material, which are continuous, *i.e.*, endless. Thus Welschlau and Alden are from diverse arts, and one of ordinary skill in the art would not have been motivated to combine their teachings. Accordingly, one of ordinary skill in the art would not have been motivated to combine the teaching of Alden with any other cited prior art document.

On page 5, the third full paragraph of the Office Action, the Examiner argues that:

> Regarding applicant's argument that there is no need to form the board in-line in Alden, the question is not whether there is any need, it is whether it would have been obvious. Batch and continuous processes are well-known alternatives in the art, so well-known the differences between them are taught in college. Substitution of one known process, printing on separate pieces, for another, printing on the continuous web, are known alternatives to one another.

The Examiner has presented no evidence or any reasoning why these two processes are known alternatives to one another for the purpose for which they are asserted by the Examiner. To modify Alden to make it use the in-line process of Welschlau, would require a complete revamping of the machinery in Alden to include the conveyors and other devices required for the in-line process. There would be nothing left of Alden except the printer. However, there is no motivation for one of ordinary skill in the art to make such an extensive modification, absent impermissible hindsight reference to Appellant's disclosure.

Further, Alden would still note relate to a method for the manufacture of sheets of corrugated board. Furthermore, even if the ordinarily skilled artisan were to modify Alden to be an inline process, there is no teaching in Alden as to how one would use digital printing in an inline process. The inline process of Welschlau uses carrier bands to print on the continuous web. The inline process of Welschlau would not work for its intended purpose, *i.e.*, to adjust the printing stations such that the printed pictures can be printed upon the advancing paper web in proper relationship to one another and over one another by shifting the carrier bands relative to one another, were it to be used in a system in which there was shrinkage of the web material. See Städele, ¶ 5. If there was any shrinkage, the carrier bands with suitably scaled printing forms would also have to be continuously adjusted relative to each other along the direction of the width of the paper web to make printing the same picture several times in proper relationship to one another and over one another possible at all. Welschlau does not address this issue as he does not address the problem of shrinkage. Städele, ¶ 5. Thus, one of ordinary skill in the art would not have been motivated, when trying to solve problems due to shrinkage, to use the methods and systems taught by Welschlau. Accordingly, the disclosure by Welschlau would not have led a person skilled in the art to the invention according to the claims, absent the impermissible use of hindsight reconstruction of Appellant's invention.

Furthermore, Welschlau does not disclose the use of a digital printing method. Only with a digital printing method in accordance with the present invention is it possible to flexibly scale a printing pattern with scaling factors, which are determined depending on a continuously monitored, varying degree of shrinkage of the corrugated web being produced. With conventional, previously known printing methods, such as rotary printing, printing forms have to be pre-fabricated rendering a continuous, flexible scaling impossible. In accord with the teachings with respect to conventional paper making machinery, Welschlau discloses the use of a rotary printing machine. Welschlau does not teach any reason why one should replace a rotary printing machine by a digital printer. Städele, ¶ 5.

The Examiner asserts, on page 5, fourth paragraph, that "printing in an in-line process would appear to quite obvious since conventional printers associated with computer [sic] are digital printers and can print continuously, i.e. banners. Applicant has shown no evidence that one in the art would not known how to use a digital printer in a continuous process." Merely because one of ordinary skill in the art would know how to use a digital printer in an inline process, does not mean it would have been obvious to do so. *See, KSR Int'l. Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 127 S. Ct. 1727, 1741 (2007) ("a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does."). Applicant has provided evidence that the proposed combination would not have been obvious to one of ordinary skill in the art. Städele, ¶ 5. The Office action improperly ignores that evidence.

The Examiner argues, page 5, second paragraph of the November 26, 2008 Office action:

> *... Welschlau is cited to show it is known to form corrugated board and print on it, thus suggesting making the corrugated board in Alden and printing on it, not taking the process of Welschlau wholesale into Alden.*

This argument is not understood. Alden already shows printing on a corrugated board. However, Alden takes a prefabricated board, already having its layers put together, and prints on it, then cuts it in such a way that it can be formed into a package. Since Alden has nothing to do with manufacturing the corrugated web material, *i.e.,* Alden does not teach "providing a corrugating machine which comprises at least two unroll stands for unwinding continuous webs of material as well as at least one processing equipment for producing at least one web of corrugated board from the webs of material", Alden does not meet this limitation of the claim. If the Examiner is citing Welschlau to teach this limitation, then the Examiner is indeed "taking the process of Welschlau wholesale into Alden."

The Examiner on page 6, first paragraph, states:

> Regarding applicant's argument that using the concept of unroll stands and a corrugated board making apparatus from Welschlau is taking the process wholesale into Alden, examiner is taking the concept of a continuous process of making corrugated web and printing on it from Welschlau and modifying Alden to do the same. Clearly since Alden does not disclose this corrugated board making apparatus, the device used would be used in Alden as it is an obvious choice for the device since it already shows a device capable of forming a corrugated board and using it in a printing process.

First, the Examiner's statement that she is "taking the concept of a continuous process of making corrugated web and printing on it from Welschlau and modifying Alden to do the same," would result in a modification of Alden that would render it unsuitable for its intended purpose – to print on precut corrugated boards. Second, on page 5 of the Office Action, the Examiner asserts that she is not "taking the process of Welschlau wholesale into Alden." Again the quoted paragraph suggests differently – presumably "the device used" in the

second sentence refers to the device of Welschlau; and the Examiner asserts it "would be used in Alden," thus taking the process of Welschlau "wholesale into Alden."

The Examiner argued previously (the Office action of December 26, 2007, third paragraph, page 2) that "…the primary reference is Alden, which is a digital printer. Examiner does not have to determine a reason to replace the rotary printer of Welschlau with a digital printer, since the primary reference, Alden, is a digital printer. Welschlau is used to suggest making the product of Alden in a continuous process as shown by Welschlau." Applicant respectfully submits that the Examiner does have to provide a reason as to why one of ordinary skill in the art would modify Alden to use the teachings of Welschlau, which uses a rotary printing machine. *See KSR.*, 550 U.S. at 414, 127 S. Ct. at 1740-41 (Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. . . .'[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.'" (citations omitted)). Further, making the product of Alden, even in a continuous process as shown in Welschlau, does not yield Appellant's claimed invention, since as discussed above, Alden does not make a corrugated board – it makes a product ***using*** a corrugated board. Appellant respectfully submits that Alden does not use a heater, so there is no shrinkage involved. The Examiner argues that "applicant's claim does not require a heater, only that a change in size of the image can occur from one step to the next. This can be due to humidity in the room, expansion of the faceboard due to the ink, stretching of the board as it passes through the process as well as the use of a heater and all of these could cause a change in the image size between one step and the next."

However, all of these things "could" cause a change in image size, but Alden does not relate to, nor teach, any solution for dealing with such changes.

Spann was used in the rejection to show that an ink jet printer is considered a digital printer and therefore the printer of Alden is a digital printing process. However, Alden and Spann do not address the issue of shrinkage and do not relate to a method of manufacturing corrugated board. Accordingly, they do not teach anything about determining and applying a scaling factor to a printing pattern to account for shrinkage. Städele, ¶ 6.

Since Alden does not relate to "manufacture of corrugated board", it would not have been obvious from Alden to use a digital printer in a method for the manufacture of sheets of corrugated board. For such a process, a person skilled in the art had previously always used rotary printers, as is incidentally also confirmed by the state of the art cited by the Examiner.

Loffler was used in the rejection to allege that it would have been obvious "to determine the shrinkage or expansion of the corrugated board by placing marks on the board and measuring their spacing downstream using a sensor to determine the change in the image size to modify the printing size upstream so that the final image is the desired size since Loffler discloses using marks to determine the amount of shrinkage or growth in the web so that the image can be altered to compensate for changes in the size of the printed image", see the paragraph beginning on page 3 of the Office action of November 26, 2008.

However, Loffler neither relates to a method for the manufacture of corrugated board nor discloses a digital printer. Loffler relates to a sheet-fed offset printing machine that prints on individual *sheets* by printer 2 and feeds the sheets to the dryer 8. The sheet size in Loffler may change due to ink, dampening medium, forces of conveying, and the thermal field in the thermo-drying device 8, col. 3, lines 48-52. These changes are detected by image detectors 6, 7 before and after the drying station 8. These data are fed to a signal processing unit 16, which controls the temperature of the dryer and/or the speed of conveying the sheets,

see the paragraph bridging cols. 4-5 of Loffler, to ensure that the amount of contraction is reduced or remains constant during the entire print run, col. 4, lines 6-9 of Loffler.

The Examiner states in the rejection, page 3, lines 7-9 of the November 25, 2008 Office action, that the "reference does not clearly disclose how this compensation occurs, but one in the art would appreciate that compensating for the change in size of the printed image *would require changing the size of the printing"* (emphasis added).

Loffler however does state explicitly what is being changed--it is the speed of conveying through the dryer or the drying temperature. The result of the change is to reduce the amount of change of shrinkage or to have it remain constant. The device of Loffler does not flexibly scale the size of the printed image by the printer inline to compensate for the shrinkage that occurs during the manufacturing process as specifically claimed in independent claims 9 and 12 because this is not possible with the offset printing machine according to Loffler. Although Loffler mentions that "the mean coordinate-dependent changes of the dimensions may be taken into account when making the printing form" (column 2, lines 1 to 3), this clearly shows that the printing process by Loffler is not a digital one and is not suited for flexible scaling of the printing patterns in an inline process. Digitally printing the printing pattern on a web of corrugated board in accordance with the determined scaling factors is not possible with the printers disclosed by Loffler.

The Examiner has used improper hindsight reconstruction to assert that one of ordinary skill in the art would compensate for shrinkage of the board (*i.e.*, "change in size of the printed image") by changing the size of the printing. However, Loffler teaches away from this method of solving the problem. Instead, Loffler teaches one of ordinary skill to reduce or control the shrinkage that occurs, thus making unnecessary any scaling of the printed image. Thus, the asserted combination teaches away from the claimed invention.

Moreover, even assuming for the sake of argument only, that one of ordinary skill in the art would have been motivated to take each of the asserted teachings from Alden,

Welschlau, and Spann and combine them with the teaching of Loffler, the result would not have yielded the claimed invention, because Loffler ***does not*** teach scaling the printed image size to account for shrinkage. Loffler instead does everything it can to make the shrinkage constant so that the printed images will always be the same size. He does not control the printer to vary the shape or size (*i.e.,* scale) of the printing.

Finally, none of the prior art references teach cutting the web into sheets in accordance with the shape and size of the digitally imprinted pattern that has been formed in response to scaling factors as recited in the last paragraphs of claims 9 and 12.

Claim 11 will stand or fall with claim 9.

VIII. CONCLUSION

For all of the above reasons, the claimed invention is not taught, disclosed or made obvious by the cited prior art and the rejection of the claims should be reversed.

Respectfully submitted,

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IX. CLAIMS APPENDIX

9. A method for the manufacture of sheets of corrugated board on a corrugating machine, comprising the following steps:

providing a corrugating machine which comprises at least two unroll stands for unwinding continuous webs of material as well as at least one processing equipment for producing at least one web of corrugated board from the webs of material;

determining the distances between adjacent marks (17, 18) on at least one of the webs of material (3) with at least one measuring device (19, 44; 19, 75, 76; 44; 75, 76) being in signaling connection with a control device (7);

determining a degree of shrinkage in at least one direction of the webs of material (3, 8, 22) based on the ratio of the distances of the marks (17, 18);

determining scaling factors for the printing pattern by the control device (7) so that the desired size of the printing patterns will appear on the web;

digitally printing the printing pattern on at least one web of material on the corrugating machine in accordance with the determined scaling factors; and

cutting the sheets of corrugated board from the digitally printed web of corrugated board in accordance with the shape and size of the digitally imprinted pattern.

11. A method according to claim 9, wherein at least one web of material is printed digitally after it has been joined to at least a second web of material, forming a web of corrugated board.

12. A method for the manufacture of sheets of corrugated board on a corrugating machine, comprising the following steps:

providing a corrugating machine which comprises at least two unroll stands for unwinding continuous webs of material as well as at least one processing equipment for producing at least one web of corrugated board from the webs of material;

determining the distances between adjacent marks on at least one of the webs of material with at least one measuring device being in signaling connection with a control device, the adjacent marks comprising a first plurality of marks extending in a first direction parallel to the moving direction of the webs of material, and a second plurality of marks extending in a second direction perpendicular to the moving direction of the webs of material;

determining a degree of shrinkage in the first and the second direction of the webs of material based on the ratio of the distances of the adjacent marks;

determining scaling factors for the printing pattern by the control device responsive to the degree of shrinkage in the first and second directions so that the desired size of the printing patterns will appear on the web;

digitally printing the printing pattern on at least one web of material on the corrugating machine in accordance with the determined scaling factors; and

cutting the sheets of corrugated board from the digitally printed web of corrugated board in accordance with the shape and size of the digitally imprinted pattern.

X. EVIDENCE APPENDIX

Alden (WO 2004/041541A1)

Welschlau (U.S. Patent 4,587,898)

Spann (U.S. Patent 6,491,361)

Loffler (U.S. Patent 5,602,746)

The declaration under 37 C.F.R. 1.132 by the inventor submitted December 4, 2007 was entered by the examiner as indicated in the Office action of December 26, 2007.

XI. RELATED PROCEEDINGS APPENDIX

None